

CNL Successful Implementation Models

A.1 Digital Management Education Pre-Course Preparation via Computer Conferencing

Abstract

DME piloted a new version of the DME "Managing Small Projects" course. To meet increasing demands on classroom time, DME experimented with enriching classroom time with pre-course work. Via a computer conference mediated by the instructor, the pre-course work allowed learners to share more information and develop a better understanding of the material, with the same amount of class time.

The computer conference pre-course work, supported by VAX Notes software, gave students a head start on the subject matter before the intensive in-person class sessions began. One major class exercise, reading and discussing a topical article, was moved from class time to pre-course work.

Not only did this free nearly 2 hours of class time, but the pre-course work also helped increase the relevance of the course to the class; the computer conference "discussions" revealed much about each student, and the instructor was able to tailor the course to better meet their specific needs.

This implementation successfully demonstrated how computer conference pre-course work can improve the efficacy of on-going learning. An unexpectedly high participation rate (over 70% of those who had enrolled for the class also participated in the pre-course conference), and the wide variety of quality opinions shared by students in the conference highlight the power of this method of learning. An increase in in-depth questions from conference participants indicates significant learning benefit.

A.1.1 Goals

The project goals are divided into a three parts.

I. Establish a low-key project with in the current framework of DME offerings.

II. Document the usages, satisfaction, and impact of VAX Note* as an on-line collaborative network for student learning.

III. Evaluate and recommend future directions and guideline* for larger scale activities for electronic collaboration.

A.1.2 Participants

Twenty students who had previously registered for the DME Managing Small Projects class were the subjects.

The particular population was an excellent test case of the non-sophisticated computer user. It allowed us to surface issues that a technologically sophisticated group would not have encountered.

A.1.3 Results

A. 1.3.1 Description of the project

As part of the pilot of the revised Managing Small Projects course, an on-line networking experience operated for one week prior to the beginning of the in-person class.

Digital's VAX Notes was used as the software platform for the pilot.

Students were notified by e-mail that the conference had been created. The e-mail message contained directions for adding the course conference to their notebook as well as an explanation of the minimum set of commands needed to read messages and enter messages into the course conference. (A sample set of directions are at the end of this section.)

The conference provided a means for students to introduce themselves, read an article excerpted from the "Soul of a New Machine", and to share ideas about good project management, as pre-work before getting together in class. It also helped the instructor to acquire students background information prior to the in-person class and tailor the learning experience to the group.

Specifically, the conference provided for exchanging information and learning in the following areas:

- Introduction to DME Project Management

- Introductions—self-introductions Course

- Expectations

- Exchange of information on Role of Project Manager Reading

- Assignment, Excerpt from 'Soul of a New Machine' which documents the behavior of one project manager Questions about the reading—

- What good and bad management qualities did the project manager exhibit?

- Questions about the reading—Would you work for the project manager and why?

The networked learning experience encouraged students to begin thinking about project management while they were still on the job. Student comments in the conference reflected their own current work experiences as well as anticipation of the future job assignments. The students were given a head start on thinking about the issues before the intensive in-person class sessions.

In the regular in-person class the same activities would have generally received about 90 minutes, plus time to read the article.

A.1.3.2 Usage, satisfaction and Impact on students

Student Participation Patterns: Flexibility is the key word to describe participation patterns. Most students participated for several short sessions, rather than one long, continuous blocks of time. The students participated on different days of the week, and at different times of the day; participation was almost equally split between morning and afternoon.

Participation Rate: Seventeen out of the twenty students who attended the class participated in the pre-course computer mediated conference. Fifty percent of the students participated in all parts of the conference. Of those who did not participate in all aspects, the main reasons given were the one week time limit and unfamiliarity with VAX Notes.

When surveyed via telephone during the middle of the pilot, the researcher discovered that some students were on vacation at the end and beginning of the week when the original notification was mailed. Other students had not read their mail, until they received the telephone follow-up call. Consequently, student« who entered the conference late in the week just did not have the time to contribute as much as those who got started at the beginning nor did they respond to all questions.

In general, when questioned at the end of the in-person class, the learners thought that this was a good way to learn. Learners who participated were satisfied with the directions and relevance of the pre-course work, but they expressed disappointment with system response time.

A.1.3.3 Recommendations and guidelines

The pilot surfaced opportunities to enhance network management at the system level, software installation, and human interface features of VAX notes.

1. Notify students at registration time and send the instructions early.

2. Establish the conference at least two weeks prior to the beginning of the course. During the end of class evaluation interview, learners recommended having the conference established at least two weeks prior to course start date. And, send a reminder to students who have not participated during the first three days.
3. Establish an open conference. One of the difficulties students had entering the conference was when we didn't have them entered by the correct name or node or when we misspelled a name. "The simplest solution is to run an open conference, but not announce it to anyone other than those enrolled in the class. (The instructor needs an E-mail address for each student to send an announcement of the conference.)

Provide simple directions for handling common error messages. One difficulty which needs to be addressed in the directions is the "node unknown" message. If the learner tries to add the conference and the reply is node unknown they should first make sure that they have entered the node name correctly. We would also recommend installing the conference on a node that is short and easy to remember, if possible. We would also recommend using a node which has been in use for a while rather than a new node. Since each network node has a database of nodes which it recognizes, the node for the conference system must be in the database. If the node is not in the database for the system, the "node unknown" message will appear. At this point, the new instructions should direct the learner to contact the system manager to make sure that node 26.37, for example, is added to the system database. It is a simple and not uncommon command for the system manager to add the new node to the database.

5. Provide instructions from DCL and All-in-One. We provided directions based upon DCL level familiarity, which was based upon an assumption that everyone has DCL access. We discovered that many people use an All-in-One menu as their interface, and that in fact the corporation will migrate to an All-in-One interface for all internal users. For one thing, the directions needed to tell them to go to "Additional Applications" on the menu where they could type "Notes" and enter VAX Notes. We need to do some additional

research on system implementation around the corporation rather than assuming that everyone works the way we do.

With revised directions, and/or a group of computer users more familiar with different applications (for example technical managers), the login difficulties will be minimal.

Encourage participants to review and react to contributions of others. Computer conferencing provides a new method for learners to share their opinions with each other, to understand that they have different, equally valid viewpoints on issues, and to react to each other in a shared forum. Participants new to the medium need to be encouraged to re-view all the contributions and react to the comments of other group members.

Encourage Vax Notes product development group and network communications to work together to improve response time. Some participants experienced unusually slow response times from their facility. Users have over time developed a low tolerance for response delays on any system; they expect to get the same response time as they would with a "slow" local application running on their system.

8. Develop guidelines for integration of the pre-course with the in-class experience. For example, students did not want to spend much time discussing topics which they had already dealt with on-line; they were ready to move on to new topics and exercises. There will need to be close coordination between development and delivery so that the on-line pre-course content and exercises are taken into account in the total design of the learning experience.

A.1.4 Conclusion

This pilot project was a learning experience. It helped us refine and revise our approaches for the next utilization. With careful plan-ning,computer conferencing can become an important means of extending the boundaries of learning in the traditional in-person classroom. The recommendations will be incorporated in subsequent implementations.

Learners from certain locations expressed dissatisfaction with response time over the net. The response time seemed to influence their overall satisfaction with the networked learning experience. However, in general, when questioned at the end of the class, the learners thought that this was a good way to learn but that they needed more time prior to the class in order to participate fully.

VAX Note* Quick Reference Quid*

To	Prompt	Typ* (followed by <RETtJRN>)
Enter VAXNote*	\$	Note*
To add the Project Management Conference to you VAXNote* library, type the following at the Note*> prompt:		
add entry Node::Conference Nam*/name-pro		
(Example ESRAO::Project_management/name«p«)		
("/name-pm" *et* up an abbreviated name for you)		
	Note*>	
O*e th* conf*r*nc* S*«		Op
conf*r*nc* contenta To	*n	fm
9*t onlin* HELP Read a	Not**»	dir/all
ap*cific not* Read a	Not*a>	HELP
ap*cific r*ply Print a	Not**>	(Nunb*r of d*«ir*d not*) 1,2,*tc.
not* or r*ply	Not**>	(Numb*r of r*ply) 1.1, 2.1,*tc.
Print a not* and all replies	Not**>	print (nunb*r of not*, r*ply,*tc.)
	Not*a>	print (number).* 1.*, 2.*,*tc.)
Enter a reply (after reading a not* or reply)	Notea>	Reply
Type reply t*xt		Enter text (th* editor will be your default text editor)
		Control/Z
Add r*ply to conf*r*nc*		
Leave the conference	Note*>	clo«*
Leave VAXNot*a Things	Note*>	*xit

If you are unable to g*t into VAXNot**, ch*ck with your Sy«t*m Manager
•ak* sure it ia on your cyatem.

2. Spelling count*. If you are unable to get into the conference,
make cure you have entered the name correctly.
3. If you l**ued a print command, printing will start after you
have exited VAXNot** and returned to the \$ prompt.
4. Printout* will go to your default printer, unlea* you indicate
oth*rwi*e.

you *hould know:

1

A.2 "Achieving Effective Communication": Integrating Classroom with Computer Conferencing

Abstract

As the quantity of information expands and the cost of classroom instruction rises, the Office Application Training group (O.A.T.) has begun seeking alternative ways to support learning and increase on-going productivity. O.A.T. expressed two major concerns:

1. In many skill areas, students need time to apply the skills on the job and see the relevance to their own life.
2. Once they leave the class, students do not take the time to practice what they learned in class; there is no one to talk to about the content or how to apply it.

Collaborative networked learning was proposed as one strategy which could address both of these concerns. Two formats were implemented in response to these concerns: a post-class conference for follow-up and a mixed mode format which would mix class meetings with on-line exercises between classes.

The post-class conference format was implemented in conjunction with the Achieving Communication Effectiveness; the impact will be reviewed at a later date.

The mixed mode class format was conducted in conjunction with the adult evening program at Northeastern University. The demonstration pilot included content and exercises which match much of that in the O.A.T. series of courses. The students were working adults who ranged in age from 20-50. The class time was approximately equal to the intensive three day format currently used in O.A.T. Between meetings, learners logged into computer conferencing and E-mail accounts to engage in on-line dialog and to complete assignments.

The results confirm the value of the format, both for achieving full learner involvement and for enabling on-going learning. It also confirms that students do participate between classes and that class time and on-line time can be appropriately mixed to cut the costs compared with utilizing a classroom for the entire time.

Several key benefits can be realized from this format.

1. The time away from the job site can be reduced and the learning time increased.
2. Skills can be reinforced and integrated into the day to day environment.
3. The mixed mode format helps maintain interest and participation in on-line class over an extended period of time.

It is possible also to support change in the work environment by using the conference to share information updates and advice on procedures with one's peers.

The learners gave the computer conference high ratings on increased quality of education, increased communication with other students and the instructor.

A.2.1 PILOT GOALS

This report is divided into three sections paralleling the three goals of the project.

- Establish a low-key pilot project which would demonstrate an enhanced approach to the current delivery strategy of an existing O.A.T. course, by:
 1. developing methods for on-going learning beyond the classroom,
 2. developing strategies for on-the-job practice and peer-to-peer support,
 3. providing time to think about and apply the course content between classes,
 4. providing an electronic forum for interaction between the in-person class meetings, and
 5. demonstrating methods which integrated in-class and electronic learning assignments.
- Document the usages, satisfaction, and impact of mixed mode on-line collaborative network for student learning.
- Evaluate and recommend future directions and guidelines for larger scale activities for mixing in-person and electronic collaboration within the O.A.T. curriculum.

A.2.2 PARTICIPANTS

Fifteen students who had previously registered for the "Introduction to Human Communication" class were the subjects for the pilot project.

The particular population we used for the pilot was an excellent test case of the adult, non sophisticated computer user. The age of the participants ranged from 20 to 50 with the majority between 20 and 30. Approximately two-thirds were female and one-third was male. Eighty percent of the group rated their keyboard skills as at least able to "type a rough draft with errors," while the other twenty percent rated their skills as "hunt and peck." All participants had access to a terminal at work except one; a majority however, indicated that they shared the terminal or could only use it off hours to participate in the computer conference. The majority participated by modem from their work (or home) by accessing at 1200 bps a host computer at Northeastern University.

Prior to the pilot, only two students had familiarity with any computer conferencing software, and not with the particular software used in the pilot. The group as a whole might be considered "computer literate" but not technologically sophisticated users. The particular student population provided a good sample to surface issues around on-line learning that a more technologically sophisticated group might not have encountered.

A.2.3 IMPLEMENTATION RESULTS

A.2.3.1 Description of the collaborative network pilot

Logistics: As part of the pilot a mixed mode course was designed which provided for out-of-class readings, in-class exercises, and on-line assignments and E-mail exchange. The Cosy Lynx system was used as the software platform for the pilot. The basic conferencing capabilities are similar to VAXNotes, but the user interface and commands are different.

Students were notified in-person about the conference and provided with a printed set of directions regarding using the Conferencing system and E-mail accounts. Students were given a "reference" flyer which contained an explanation of the minimum set of commands needed to read messages and enter messages into the course conference.

Conference topics: The conference provided a means for students to introduce themselves, to discuss key concepts from the class exercises and reading, and to complete a major case study assignment by working collaboratively, on-line at the end of the course. In conjunction with the computer conference, all students had E-mail accounts which they used to exchange private messages with each other and the instructor between classes.

The conference provided for information exchange on the following topics:

- Introduction to Communication
- Introductions-self-introductions
- A brief reading and discussion of self concept and its influence on communication
- Language and achieved shared meaning
- Active listening and emotional listening
- A brief reading on self-disclosure and a discussion of guidelines for appropriate disclosure
- Interpersonal Conflict Case Study development, in which students in groups of four entered a detailed description of one communication conflict, of which they had personal knowledge; and
- Conflict Resolution Case Study Preparation, Analysis and Resolution group exercise.

The case study assignment on conflict resolution was one very effective use of the collaborative medium, which mixed both in person and on-line work, as follows:

- 1. During the class time, students divided into small groups to brainstorm topics for the case and then plan their course of action. This activity required a high level of real time interaction;
- 2. Students then prepared drafts of their portions of the case and exchanged them on line for review before the next group meeting,
- 3. One member of the group posted the completed project in the conference.

- 4. Each member of the class could then individually review and recommend solutions for the conflicts. Students integrated previous class material, personal opinions, and comments of their peers to complete the assignment.

A summary of this particular assignment is included at the end of this section.

Finally, one section of the conference was devoted to an "electronic lounge" where students were encouraged to exchange general, social comments equivalent to a coffee-break conversation.

Summary of observations: The networked learning experience encouraged students to continue thinking about communication and to engage in both public and private dialog electronically between classes. Student comments in the conference reflected their own current work experiences as well as well as their own personal communication experiences.

The students who often did not speak up in the in-person group, did share insights and ideas on-line. As one student commented in the evaluation, Conferencing is "...very valuable, because, a student may not wish to voice his/her opinion face to face, but opts for computer communication instead."

In this format, students engaged in on-going learning and discussion of ideas between classes with each other as well as the instructor.

The results confirm the value of the format, both for achieving full learner involvement and for enabling on-going learning. It also confirms that students do participate between classes and that class time and on-line time can be appropriately mixed to cut the cost associated with utilizing classroom only for the entire time.

A.2.3.2 Usage, satisfaction and Impact on students

Student Participation Patterns: Flexibility is the key word to describe participation patterns. Most students participated for several short sessions, rather than one long, continuous block of time. The students participated on different days of the week, and at different times of the day. The participation was generally higher the day before the in-person meeting. Apparently, encountering one's peers face-to-face is an

incentive to complete on-line assignments and respond to the messages posted by other students.

Networked Learning through Computer Conferencing Participation

Rate:By the end of the pilot all fifteen students were participating in the on-line computer conference. Of those who did not participate in all aspects, the main reasons given was their unfamiliarity with communications software or modem operation at the beginning of the pilot; they were able to overcome these difficulties through help from other students or phone support from the instructor. All students completed the final group case study project on-line.

Early in the pilot, several concerned students began a discussion of the importance of feedback in electronic communication, raising their own awareness of the need to provide feedback to acknowledge their participation.

Satisfaction: Learners expressed satisfaction with the directions and relevance of the supporting documentation. They expressed no dissatisfaction with access or response time. A number of students thought that the text editor was confusing and that the instructions were minimally helpful. However, all fifteen students were able to master enough of the basic commands to enter their own messages and read the messages of others during the first few attempts with the aid of an abbreviated listing of essential commands and other reference material.

When questioned at the end of the in-person class, the learners rated the computer conference well above average in terms of increased communication and quality of education. On a five point scale with 1-"agree", &-"disagree",and 3—mid-point, the group rated the conference experience as follows:

Table I Summary of Average Rating* for Quality Scale

Increased communication with other students	2.3
Increased communication with the instructor	2.6
Increased the quality of the education	2.0

Besides completing rating forms, students responded to open ended questions about the value of the experience. One student stated in the post evaluation, the conference was "...very important for peer to peer information exchange. I just wish I could have accessed the system more." Or, as another student stated," Good information exchange beyond the classroom." Another student commented that communicating electronically was "...very helpful because I am a hard person to reach by phone."

A.2.3.3 Recommendations and guidelines

The pilot surfaced opportunities for improvement of system level management and support, human interface features for educational uses, and design of mixed mode learning environments.

1. If possible, provide a hands on demonstration for the novice user. If this is not feasible provide a clear set of directions, and provide phone or on-line support with a designated individual during the initial start up period.
2. Establish norms of participation and expectations at the beginning of the program. Students who are unaccustomed to learning and communicating electronically need to know that providing feedback and participation is the norm. Some course conference leaders have recommended requiring a minimum number of entries.
3. Encourage participants to review and react to contributions of others. Computer conferencing provides a new method for learners to share opinions, to understand that they have different, equally valid viewpoints, and to react to each other in a shared forum. Participants new to the medium should be encouraged to review all the contributions and react to the comments of their peers.
4. Encourage the addition of educationally-oriented features to the conferencing software. In this project, it would have been useful to have different branches of activities that the moderator could elect. Consider the following:

(a) Moderators sometimes need to hide student comments until all students have responded. Individual comments would have been useful. In this pilot, the instructor included a game, like quiz, requiring students to solve a riddle. The instructor needed to be able to have all students try to solve the riddle before sharing their responses.

(b) Another useful branching option would be a selection menu option, which would allow different students to select different topics or assignments. The instructor and students would know who had selected which assignment and which was still available for others.

(c) Another useful response option, would be a voting "object" that could be placed at any point in a reading assignment or section to see the percentage of persons who agreed or understood an issue at that particular time.

5. Establish a simple interface for moderator and students. For example, while in the conference the instructor would like to easily send messages to a distribution of a sub-set of the class. Or, student would like to send a comment to the moderator and a group of students who have expressed a particular viewpoint on a issue.

6. Add instructional management features to the conferencing software. The software, for example, could automatically indicate who had contributed their comments to a particular topic, or record "attendance" in the conference. For large classes in which learners complete individual assignments, it is very important to provide a way to find, sort and transfer each individual assignment to the moderator's special "notebook;" consequently reducing the time the moderator needs to search for learner assignments.

7. Response time was not a problem for most participants, since the majority accessed the system via modem. If response time over the network internally is perceived as being inadequate, it is recommended that the following options be considered:

(a) If the majority of students are in one site, install the conference on a local system rather than the instructor's host system;

(b) If the students are widely dispersed, provide directions for for uploading and downloading information into the conference, or encourage access by modem.

8. Establish deadlines for completion of structured activities. For activities which require coordinated group activities, it is important to create timelines for participation for each phase of the activity so that everyone knows when each part needs to be finished.

9. Provide an environment which provides for both moderator and student initiated topics. The moderator needs to establish initial core topics as a framework for the conference. Students need to be encouraged to add topics which they feel are relevant and important. The moderator will need to establish a structure which allows users to easily locate the appropriate section.

10. Integrate the on-line course with the the in-class experience. Students do not want to spend time discussing topics on-line which they have already shared opinions in class; they were ready to move on to new topics and exercises. There will need to be close coordination between development and delivery so that the on-line course content and exercises are taken into account in the total design of the learning experience.

A.2.4 CONCLUSION

This demonstration project helped us refine and revise our approaches for the next implementation. It highlighted the need for careful design to optimize the use of the classroom time for in-person activities, and exploit the on-line capabilities for activities appropriate to the electronic medium. With careful planning, computer conferencing can become an important means of extending the boundaries of learning of the traditional in-person classroom.

In general, the students and instructor expressed satisfaction with a mixed mode form of learning, which allows students to interact between classes.

Several key benefits can be realized from this format. The time away from the job site can be reduced and the learning time increased. Skills can be reinforced and integrated into the day to day environment. The mixed mode format helps maintain interest and participation in on-line class over an extended period of time. It is possible also to support change in the work environment by using the conference to share update information and advice on procedures with one's peers.

The findings from this pilot will be incorporated in subsequent implementations, as the advantages of economy and convenience of computer conferencing are applied to course setting within Digital.

CONFLICT OBSERVATION AND RESOLUTION
Case Study Assignment On-line

To help you understand how to develop strategies for receiving conflicts, I would like you to work with a group of three or four other individuals to prepare a written description of a conflict situation. The situation you select could be of a personal or professional nature. Select a conflict that has been observed or resolved by one of the members, or one that is on-going if a member wishes to volunteer a situation. The report should include a detailed description of the conflict. Don't include the resolution or outcome in the written report initially. If appropriate, you may want to provide a follow-up message after everyone has read and commented on your description.

Your group will present the description to the class in the ton of a message posted on lynx no later than Friday June 3rd. Each report will be posted in a separate topic. You can accomplish this by entering the report directly or upload the report.

Each person will then have until June 8th to read, comment, pose questions, and suggest strategies for resolution bases on your understanding of conflict resolution. I would also suggest that you may want to read all the comments after June 8th.

I would suggest that the information on each of the parts be limited to one or two screens and that you indicate each continuing screens as such. To provide a clear picture of the conflict you will want to consider at least the following aspects.

The IDENTITY of the persons

1. Who are the parties individually?
2. Who are the parties as part of the relationship?

The SETTING of the interaction.

1. What is the present context?
2. What is the past history of the interaction?
3. What is the stage of the relationship?

What are the ACTIONS and MESSAGES?

Provide a sample dialog(s) which will illustrate the nature of the conflict. The following questions will help develop the

dialog.

1. What is said by each person?
2. What is the verbal reaction to the message?

3. What are the non-verbal action*?
4. What are the non-verbal reactions?

What is the FUNCTION of the actions and message*?

1. How do the action* or message* create, continue or resolve the conflict in the situation?
2. What are the individual* attempting to communicate with the action* and messages?

What are the MOTIVES behind the messages and action*?

1. What value*, want*, or need* are underlying the action* and verbal message*?
2. What is their perception of incompatible goal*, scarce reward*, or interference in achieving goal*?

What are the FEELINGS/EMOTIONS involved in the conflict?

1. How are (or are) the emotion* of feeling* expressed?
2. What are the dominant emotion(s) at the present time?
3. What is the level of intensity of the emotion(s)?

A.3 PURPOSE DRIVEN CONFERENCING-University College Galway

Abstract

Digital's Enterprise Design Group in Reading, UK, is engaged in a practical project in computer-mediated conferencing with members of Ireland's salmon-farming industry. Digital's purpose is to learn about connecting members of the public together with computer-mediated conferencing. It is a specific decision to make the conference a "directed conference", or "purpose driven" so that its metaphor is a meeting, rather than a talking shop, classroom or an information-distribution process.

The Conference is centred upon the University College Galway, Ireland, with 16 participants drawn from the west of Ireland salmon farms, farming co-operatives, and industrial interests. The moderators (although we have chosen to use the term "chairmen") of the Conference are drawn from the College. None of the chairmen or the participants have any prior experience of computer-mediated conferencing (or, in the most part, of computers).

The on-line conference is planned to last 3 months. Its principal theme is "How to ensure that Irish salmon is the preferred choice in Europe". There will be a parallel theme asking "What are the communication and information needs of Irish aquaculturists". ["Aquaculture" - cf agriculture]

The conference is hosted by a microVAX running VAXNotes. Participants were loaned VAXMate PCs which has installed user-interface software to VAXNotes called Passkey.

The principal Digital people involved are

1. Ulf Fagerquist: Project Initiator and Sponsor
2. DCS McKane: Project Overseer
3. George Metes: Conferencing Consultant
4. John Gundry: Social Factors Director and Local Programme Organizer.

A.3.1 Goals

The Digital group became involved in the conference in order to explore the following questions:

1. HOW DO WE MAKE PURPOSE-DRIVEN CONFERENCES SUCCESSFUL?

Stated rather formally, our principal hypothesis is that CMC can be a successful medium for a purpose-driven discussion about business issues. Or put another way, that there IS a CMC equivalent of a business meeting. If we can make this Conference successful - on some measure of improved resolution around the business issues - then we will have learned something. Alternatively, we might find that although the Conference was judged a valuable learning experience by the participants, that we could not find any measure of improved resolution. That again would tell us something.

2. HOW DO WE CATER FOR COMPUTER-NAIVE PARTICIPANTS?

We are conducting a test of the WBSI PASSKEY software. This has been specifically designed for simplicity of operation. But is it simple enough? And are our training arrangements going to be sufficient? Will the user interface even then be a stumbling block to participation in the Conference?

We will also be alive to any significant points about the underlying functionality of VAXNotes.

3. HOW DO WE DESIGN THE SOCIAL FACTORS SUCCESSFULLY?

But we have made a number of social factors decisions based on our own views and those of WBSI. We again have the hypothesis that collectively and individually, those are the right decisions for this Conference. We will be seeking to find out if they are.

Perhaps one of the biggest decisions we have made is that the people from the University College, after some training, will be suitable in the moderator, or chairman, role. Will we find, however, that the observers have continually to prompt the chairmen to fulfil that role?

4. HOW DO WE HANDLE COMPETITION BETWEEN ORGANIZATIONS?

We will be putting together individuals from organizations who may be in direct commercial competition. Will those individuals want to interact, even to disclose sensitive information, or will their organizational role take precedence. We know that social status does not transfer strongly to CMCs, but will organizational membership behave likewise. If we made contributions anonymous for some period, would that free up any blocked interaction?

5. THE BIG QUESTION: IS THIS APPLICATION OF CMC DELIVERABLE TO ACCOUNTS

Viewed overall, will we have progressed to any view that, with the social and technological factors configured appropriately, purpose-driven computer-mediated conferencing is a product/service offering that is deliverable to the Corporation's accounts.

A.3.2 INVOLVEMENT OF THE WESTERN BEHAVIORAL SCIENCES INSTITUTE

The project is receiving contract consultancy from the Western Behavioral Sciences Institute of La Jolla, California.

The Western Behavioral Sciences Institute, or WBSI, is based in La Jolla California. WBSI have been involved in running particular types of computer conference for about five years, and style themselves as conferencing specialists.

WBSI has received considerable support and sponsorship from Ulf Fagerquist and Bill Johnson, and have undertaken two specific pieces of work of relevance to this Conference. First, they ran a research programme to investigate the social factors of CMC. Broadly, these are to do with how to connect people rather than how to connect computers. The second piece of work was the development of user interface software for MS DOS personal computers. This software is called PASSKEY and provides a simpler means of accessing the functionality of conferencing systems such as VAXNbtes.

Neither of these two pieces of work had been validated at the start of this exercise, and so we retained WBSI as consultants to the project in order for them to transfer and test those materials.

A.3.3 THE CONFERENCE TOPICS

Given EDO's interests, which I described earlier, we saw the opportunity to mount an exercise in CMC in the West of Ireland. But what would be the application of the conferencing? Would it be distance learning, or information distribution, or building a social group? In fact the goal we chose included all these and more. Those applications of CMC are being understood within the Corporation, and the CNL Forum is evidence of that. But from our perspective one application had not been tackled: that of using CMC to resolve business issues - that is, to establish a computer-mediated business meeting. We saw the "directed" or "purpose-driven" aspect of a conference as being a key issue of this exercise.

In the course of very positive discussions with the President of the University College and members of the faculty, the Conference themes were decided. It would be a conference to answer two business questions in Irish aquaculture. First, how to ensure that Irish salmon is the preferred choice in Europe, and second, to define the information needed by the Irish aquaculture industry to be successful, and the best means of delivering that information. Irish salmon farms and industry interest groups would be invited to participate.

The context of that decision should be explained. Irish aquaculture is one of the few growth industries in the Republic, and salmon farming is a new and particularly-expanding sector. It involves multi-national companies, salmon-farming co-operatives, and individual farmers. The

industry is growing so fast that co-ordination amongst its members is a real problem, and there are a number of environmental and technical problems associated with that explosion. The themes for this conference were judged to provoke industry interest, and to bring together people who would otherwise would not share their expertise. For we are talking about people spread out over perhaps 200 miles of rugged coastline in which even the major roads are poor by *US* standards.

A.3.4 THE PARTICIPANTS

We therefore plan to invite 12 to 16 organizations in Irish salmon-farming to participate in the Conference. For strategic reasons, we decided that the Conference should be concluded in FY89 - and so we plan to run the on-line conference in April, May and June of this year. It is important for me to make one point here about the participants: they are being selected only with regard to their contribution to the Conference themes. We are very deliberately not imposing any form of condition around ownership of computers or pre-knowledge of computers. We are prepared for participants who are entirely computer-naïve. That is part of the challenge of this project and the source of much of our eventual learning.

A.3.5 TECHNOLOGY INFRASTRUCTURE

We shall loan the participants VAXMate personal computers for the conference. We are using VAXMates because they are the only Digital MSDOS machine, and validating PASSKEY (which runs on MSDOS) is a goal of the exercise. These VAXMates will be installed in participants' offices or homes, but principally, we believe, the former. The host computer will be a micro VAX, running VAXNotes, which will connect via modems at either end to the VAXMates, over the Irish telephone network.

I should Bay here that this Conference is not a Trojan horse to sell the VAXMates to the participants, and we intend to collect them back when the Conference is over. Of course, if participants see the opportunity for networked technologies, and eventually buy from Digital, then that will be a welcome upshot for the Irish subsidiary.

Technology support in the form of installation, field service, user training and a user hotline have been volunteered by the Ballybrit plant in Galway, where the host computer will be sited. We are very grateful for Ballybrit's offer to provide this support.

A.3.6 SOCIAL INFRASTRUCTURE: CHAIRMEN, EXPERTS AND OBSERVERS

We have paid particular attention to establishing the necessary roles within the social infrastructure. The Conference chairmen are from University College Galway - there will be one moderator for the 'salmon' conference and a moderator and a deputy for the 'information and communication' conference.

We have, however, chosen not to title these people "moderators". Instead we have chosen the term "chairmen". We feel that this sets a context appropriate to a computer-mediated meeting. We rejected "moderator" and "facilitator" as too confusing for the general public. "Co-ordinator" was rejected as sounding too much like an authority figure, whilst "manager" was more relevant to a project than a meeting. None of the chairmen has any recent experience with computers and none have any experience of CMC. The chairmen have, however, received education in "moderating" a conference, from WBSI.

We are not raising the expectation that the chairmen are founts of wisdom on all the topics that will arise in the Conference. Instead, there is panel of experts for the chairmen to consult on substantive issues. Whilst some experts have come from the faculty at University College Galway, we have an international panel.

We announced these conference roles to the participants in a briefing session about the conference. Likewise we announced that there are observers of the conference. These are George Metes and John Gundry of Digital and Dr Beryl Bellman of WBSI. Their role is to read the conference on-line and support the chairmen, although they will not make any direct inputs to the Conference itself. We have established a

closed conference for the chairmen and the observers in order that they may dialogue.

A.3.7 PROGRAMME

Our programme for the Conference involved the following serial stages. After a period of intensive planning, we are just about to start the _____ second stage.

A.3.8 SOCIAL FACTORS SEMINAR

We organized a seminar in Galway for the Conference chairmen in the course of which a consultant from WBSI delivered "moderator" training, _____ and the social factors of the Conference were discussed

A.3.9 INVITATION TO POTENTIAL PARTICIPANTS

The Professor of Oceanography at UCO, who is one of the Conference chairmen, wrote to organizations in the Irish aquaculture industry to announce the Conference. He invited them to come to a briefing session _____ to hear more.

A.3.10 BRIEFING SESSION

The briefing session presented a user-oriented account of the Conference and the computer arrangements. We have gone to some trouble to prevent the use of computers being a block to people signing up for the Conference, and we have, we hope, a presentation that allays people's fears. It also introduces the topics and other arrangements for the Conference. After the briefing session, people were given a week to decide whether they wish to participate. Participation is, of course, free.

A.3.11 TECHNOLOGY INSTALLATION

Digital's engineers from Ballybrit installed the VAXMate personal computers in participants' offices and homes. These machines were stripped of any user software other than the WBSI PASSKEY interface to VAXNotes. During this period, the microVAX was configured at Ballybrit, and the telephone connections established.

A.3.12 CONFERENCE FORUM AND TRAINING SESSION

Participants were invited to a two-day Conference Forum at the University. There were two principal agenda items. First, they had the opportunity to feel their way to the issues to be discussed in the conference - so that they would not be surprised when those issues come up on-line. Second, the participants received hands-on training in using the VAXMate computers and the conferencing system. In addition to these declared items, they all had the ability to meet each other and the chairmen. This is known to be a powerful way of setting the context for a CMC. It allows people to put a face to a name that comes up on the screen.

The forum also provides the opportunity for the chairmen to describe the arrangements for conference etiquette, confidentiality and the like, which I do not have time to describe here. We must also work on making motivations towards the Conference strongly positive.

Finally, that Forum allows Digital to collect some pre-Conference information about participants' expectations and concerns, as well as their level of resolution around the business issues

Following the Conference Forum, the participants went back to start immediately on the on-line Conference. The chairmen had written the opening topics.

A.3.13 MID-TERM ASSESSMENT

The chairmen and observers will of course be conducting continual review of the way that the conference is going, but we are instituting a formal mid-term assessment. That assessment gives us the opportunity to discuss if there have been any major technological or social breakdowns, and what we need to do about them.

A.3.14 END OF CONFERENCE MEETING

At the end of the computer-based conference, we shall hold a one or two day meeting back in Galway. This will provide the opportunity for drawing some conclusions from the conference - and to plan or progress the writing of the Conference Reports on the business issues addressed. That meeting also allows Digital to de-brief the participants on all aspects of the conference: the technology, the user interface, the social design, and the degree of resolution around the business issues.

A.3.15 POST-CONFERENCE

When the Conference is over, Digital and WBSI will be preparing reports on the learning and experience gained during the Conference. For more information on this collaboration contact Rdyend::gundrv.

A.4 Electronic Seminar—Multi-media Computer-based networked learning environment

A.4.1 Enrollment and audience

The format below could be used with DCVN broadcasts for large audiences of 200-300 hundred or for smaller groups of 10-20 using VHS video tape copies.

A.4.2 Format

This multi-purpose format is seminar based and is to be conducted electronically. The presentation portion of the seminar is to be delivered via a series of DCVN broadcasts and a VAXNotes computer conference. VHS video tape copies of these broadcasts could be made available at all participating in this program within 48 hours of each broadcast. Audience participation will begin during the question and answer portion of these broadcasts. Audience participation will continue between each broadcast in a VAXNotes computer conference. This conference will also be the delivery method used for all course materials. On-line interactive testing will be provided by testing software layered on VAXProducer software. In addition, a VAXmail account will be established for private communications with the participants, and panelists.

A VAXNotes conference will open three weeks before the first broadcast, and close three weeks after the last broadcast. All student activity between the broadcasts will reside in this conference. The number and length of conference sessions will be left to the discretion of the individual student.

The student must be able to ask questions and get the right answers. The delivery method must allow for open discussion of the concepts being studied. The material requires the student to apply the knowledge. Hands- on exercises will be provided, and the results of their work will be reviewed and discussed.

Learners are often too busy to attend lengthy training in a single session. In general the typical learner may have a heavy workload. Their workdays maybe long, and their availability for learning is sporadic and difficult to schedule. The delivery method must allow the student to attend when possible and for whatever length of time is available.

A.4.3 Key benefits

Flexibility is the key valued added service. The development and delivery method used for this learning offers the following benefits:

- **Timely delivery of the material**
- **Delivery at the local level**
- **Maximum delivery flexibility at the individual student level**
- **Detailed material with exercises**
- **High degree of interactivity at all levels**

Discussions and questions about the material are expected and encouraged. Projects surrounding the material could be performed in local site teams. And, it is expected that the less experienced in the audience will gain insights and experience from the more experienced in the audience.

A.4.4 Equipment requirements

The following is a list of the minimum equipment and access the participants must have to participate:

- VTxxx terminal
- System account
- DSNet access
- VAXNotes access
- DCVN broadcast and DTN access
- LN03 or LN03R printer
- E-mail account
- VHS video tape player access

A.5 WGBH On-line

Abstract

WGBH now offers integrated interactive information services on DELPHI/Boston, an internationally-accessible computer telecommunications system. * Most of the menu driven interfaces, E-mail, and editors will appear very familiar to Digital users.)

WGBH On-line, an electronic information service of the WGBH Educational Foundation, offers the corporate community an opportunity to provide its employees, and the general community, with access to new types of educational resources. The service allows anyone with a computer and a modem to tap into the service.

* DELPHI *if* a Digital customer and their conferencing service* are VAX-Based. A-30

CNL Successful Implementation Models

A.5.1 Goals

The major purposes of the on-line forums is to create an on-line environment where participants can interact with each other as well as share comments with experts. Not only does this provide a community outreach forum for WGBH but it also provides an interactive continuing learning medium for the participants.

The plan calls for guest moderators for the on-line forums. Moderators who be experts who appeared in a particular NOVA series or a recognized expert in the field being discussed.

A.5.2 Description

One of the major aspects of the on-line service is the integration of broadcast with computer conferencing for discussion of related topics. A broad range of print support materials are developed for each of the programs. The print materials include discussion guides, teacher guides, and student textbooks and workbooks for telecourses. The materials are made available in print or as text resources for the online forums, verbatim, excerpted, or specially adapted. Most of the on-line text files are in ASCII format so that they can be accessed by any type of computer, but it is also possible to include downloadable files in word processor formats which could be printed with page breaks and some graphic layout elements.

Users can also search and access on-line databases on information related to the programs, send E-mail comments to WGBH, as well as access information stored in transcripts. The transcript options include:

- Search the entire catalog by keyword
- Order printed copies of any transcript
- Capture/download NOVA and Frontline transcripts

Print copy orders and downloaded transcripts are automatically billed to the users credit card numbers.

Table 1: Traditional and CNL Models of Knowing

Traditional Business Models	CNL Models
Topics are stable	Topics are unstable or being created
Problem or question has a known answer	A problem or question has no clear answer yet
Someone (teacher, expert, course developer) has the answer	No one person has the answer—it is dispersed or hidden within a group or organization
The answer is "transmitted" through a familiar learning technology	The "answers" are obtained by groups in cooperation, who may not be co-located
Learner receives and knower gives	Knowledge needs to be captured, synthesized, generated, filtered and summarized
A structured approach is usually taken	A less structured or networked approach is taken
Interaction with other learners or knowers is minimal (e.g. classroom lecture, videotape, or CBI)	Interaction may be asynchronous or synchronous between co-learners
Packaging	Human Networking